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# **Suisun Marsh Monitoring Program Channel Water Salinity Report**

Reporting Period: January 2002

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## **CONTENTS**

This report is organized into the following sections and subsections:

➤ **SUISUN MARSH MONITORING STATIONS AND REPORTING  
REQUIREMENT**

➤ **RESULTS**

**Channel Water Salinity Compliance**

**Delta Outflow**

**Rainfall**

**Suisun Marsh Salinity Control Gate Operations**

➤ **DISCUSSION**

**Factors Affecting Channel Water Salinity in the Suisun Marsh  
Observations and Trends**

Conditions During the Reporting Period

Comparison of Reporting Period Conditions with Previous Years

Questions regarding this report should be directed to:

Ken Minn  
California Department of Water Resources  
Environmental Services Office  
3251 S Street  
Sacramento, CA 95816-7017

Telephone: (916) 227-7520  
[kminn@water.ca.gov](mailto:kminn@water.ca.gov)

## **SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT**

The California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. This requirement is based on SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions. Channel water salinity conditions in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance".

The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

<b>Station Identification</b>	<b>Station Name</b>	<b>General Location</b>	<b>Status</b>
C-2	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

<b>Station Identification</b>	<b>Station Name</b>	<b>General Location</b>	<b>Status</b>
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates is included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

The reader will likely notice the absence of data from C-2 from the report. In early December 2001 a large floating dock segment struck the EC probe pipe, rendering it incapable of collecting EC readings. To supplement the loss of C-2, data from monitoring station C-2B has been included in this report; and, although not officially a designated a compliance station by SWRCB, C-2B is C-2's intended replacement. In the following text, therefore, C-2B has taken the place of C-2 in both tables and graphs.

## **RESULTS**

### **Channel Water Salinity Compliance**

State Water Resources Control Board channel water salinity standards for the Suisun Marsh were met at all five compliance stations during January 2002 (Table 1). Compliance with channel water salinity standards was determined for each compliance station by comparing January mean high-tide specific conductance (SC) with their respective standards. The standard for Marsh compliance stations for January 2002 was 12.5 millisiemens per centimeter (mS/cm). Table 1 lists monthly mean high-tide SC at the compliance stations.

The progressive monthly mean SC for each station is used to track salinity conditions during each month (Figures 1 and 2). The progressive mean is calculated for each compliance station by averaging mean high-tide SC for a given day and all previous days of that month. New progressive mean calculations begin at the start of each calendar month.

### **Delta Outflow**

High Delta outflow occurred in January 2002 (Figure 3). The monthly mean Net Delta Outflow Index (NDOI) for January is listed below:

<b>Month</b>	<b>Mean NDOI (cubic feet per second)</b>
January	37,786

The NDOI is the estimated average daily rate of outflow from the Delta.

### **Rainfall**

Total monthly rainfall at the Waterman Gauging Station in Fairfield during January 2002 is listed below:

<b>Month</b>	<b>Total Rainfall (inches)</b>
January	3.10

## **Suisun Marsh Salinity Control Gate (SMSCG) Operations**

The SMSCG were under normal operation at full bore for January 2002 with flashboards in place with operating boat lock.

<b>Date</b>	<b>Flashboard / boat lock Status</b>	<b>Gate Status</b>
January 1 – January 31	In place / Operational	Tidal Operation

## **DISCUSSION**

### **Factors Affecting Channel Water Salinity in the Suisun Marsh**

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

The State Water Resources Control Board, in 2001, approved another three years of study on the Suisun Marsh Salinity Control Gates to evaluate a method to allow unimpeded passage of adult salmon past the gates on their upstream migration. The evaluation of the modified flashboards was discontinued after two years because it was not successful. The new study is to evaluate the effectiveness of leaving the boat lock open when the gates are operating. The boat lock evaluation started in the fall of 2001 and will continue through the fall of 2003.

### **Observations and Trends**

#### **Conditions during the Reporting Period**

Channel water salinity conditions in the Marsh met the standard in January 2002. For most stations, except S-21 and S-35, the salinity curve can be described as a shallowly concave shape where salinity drops slightly during the middle part of January, with

month end values slightly higher than beginning month values (Figures 1 and 2). In mild contrast, S-21 experiences a slight dip in conductance early in the month, then slowly increases throughout the month (Figure 1); while S-35 values gradually fluctuate during the month to end at approximately the same value the which it began (Figure 2). The low conductance values for January 2002 can likely be attributed to high delta outflow, especially at the month's start (Figure 3). The drop off in NDOI at the end of the month may also account for the slightly higher end month conductance levels.

### **Comparison of Reporting Period Conditions with Previous Years**

Monthly mean high-tide SC at the compliance and monitoring stations for January 2002 were compared with means for those months during the previous nine years (Figure 4). Means at all compliance and monitoring stations indicate that January 2002 was a fairly low year. Relative specific conductance values between stations of 2002 moderately resemble those of 1997. 2002 and 1997 are also the only two years where S-97 has a higher mean specific conductance than S-35. However, it should be noted that the data set for S-35 of January 2002 is incomplete.

**Table 1**

**Monthly Mean High Tide Specific Conductance at Suisun Marsh  
Water Quality Compliance Stations**

**January 2002**

<b>Station</b>	<b>Specific Conductance (mS/cm)*</b>
<b>Collinsville, C-2B</b>	0.6**
<b>National Steel, S-64</b>	0.9
<b>Beldon's Landing, S-49</b>	1.5
<b>Volanti, S-42</b>	2.1
<b>Sunrise Club, S-21</b>	2.1

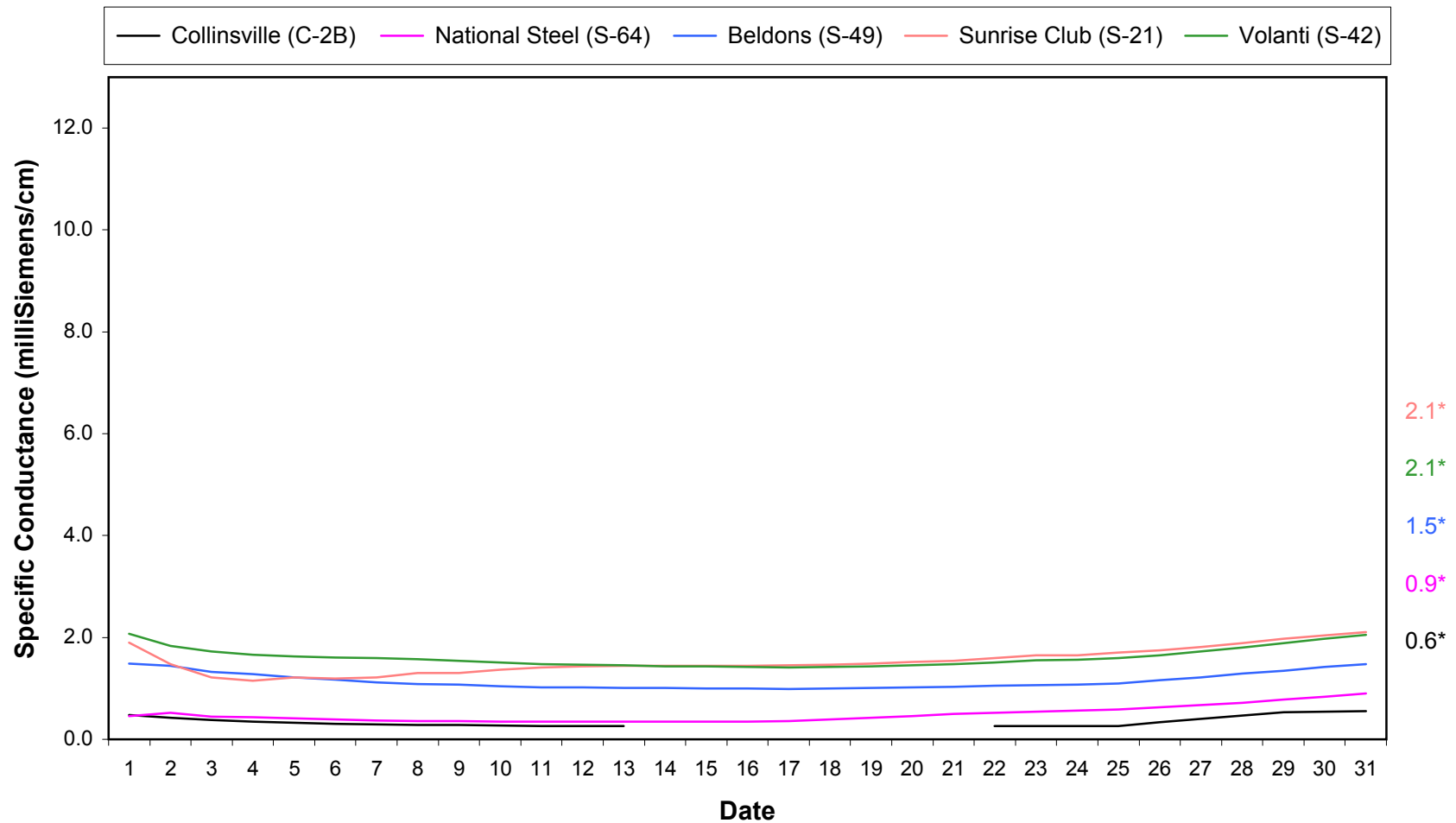
\*= milliSiemens per centimeter

\*\*= value does not reflect end of month means due to equipment failure during the month

Note: SWRCB standard for January for is 12.5 mS/cm.

**Figure 1. Suisun Marsh Calendar Month Progressive Mean  
of the Specific Conductance at High Tide  
January 2002**

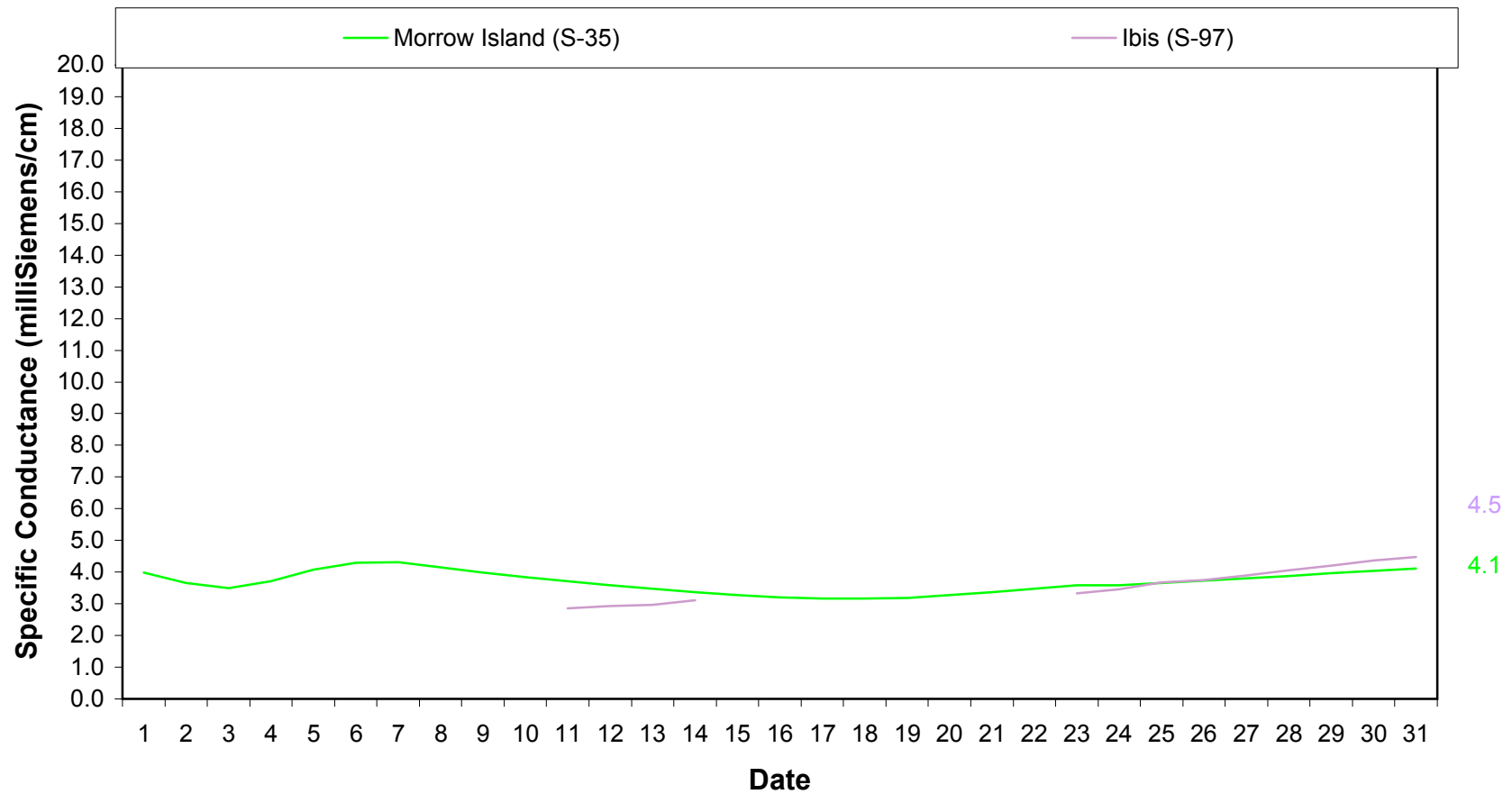
Standard = 12.5 mS/cm



\* = monthly mean specific electrical conductance at high tide.

Note: C-2B data from 1/14/02-1/21/02 missing due to power failure at station.

**Figure 2. Suisun Marsh Mean Daily High Tide Specific Conductance  
at Monitoring Stations S-35 and S-97  
January 2002**

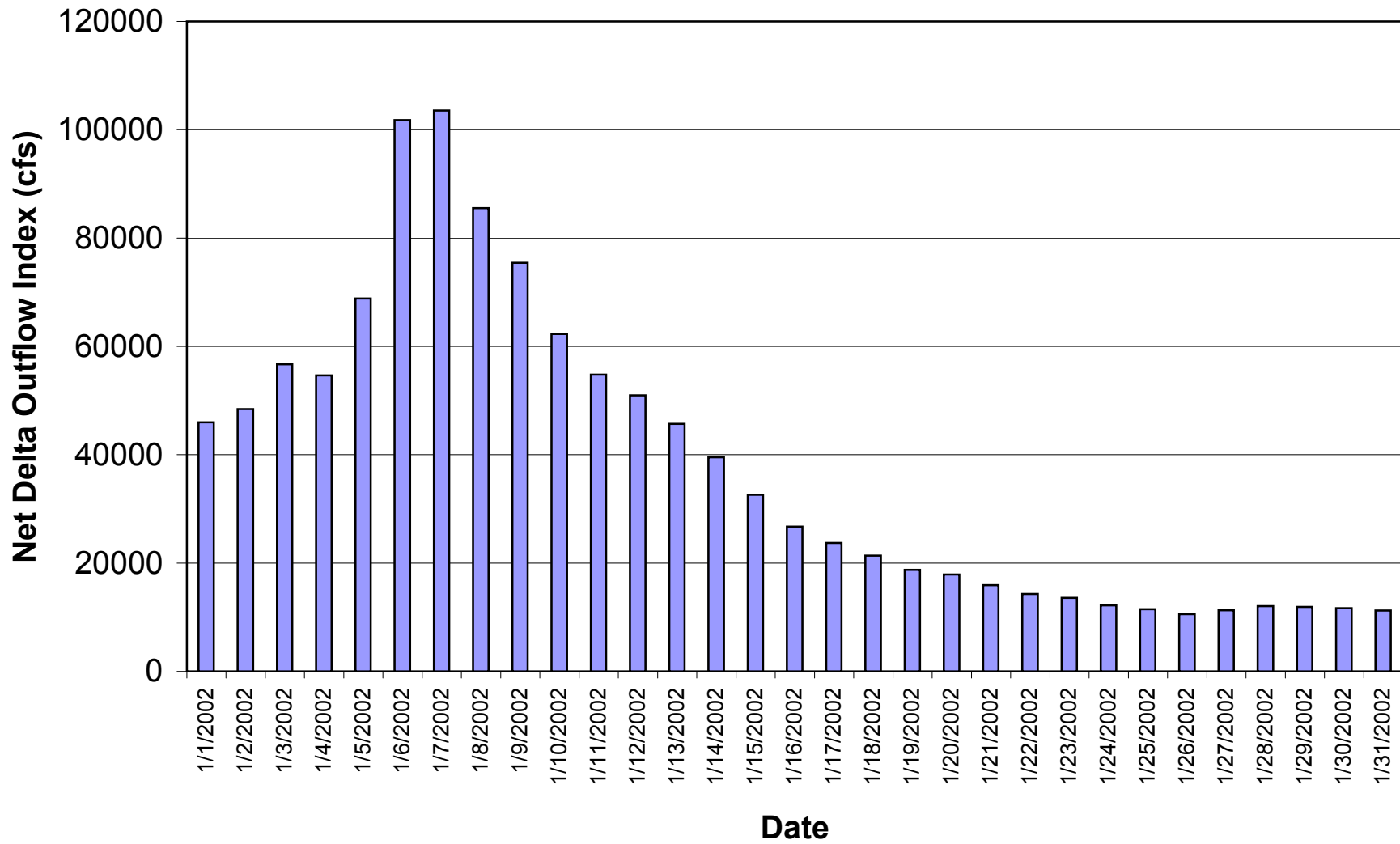


\* = monthly mean specific electrical conductance at high tide.

Note: Data missing from S-97 due to equipment failure from 1/1/02 through 1/10/02 and 1/15/02 through 1/22/02.



**Figure 3. Daily Net Delta Outflow Index For  
January 2002**



**Figure 4. Monthly Mean Specific Conductance at High Tide:  
Comparison of Monthly Values for Selected Stations  
January 1993-2002**

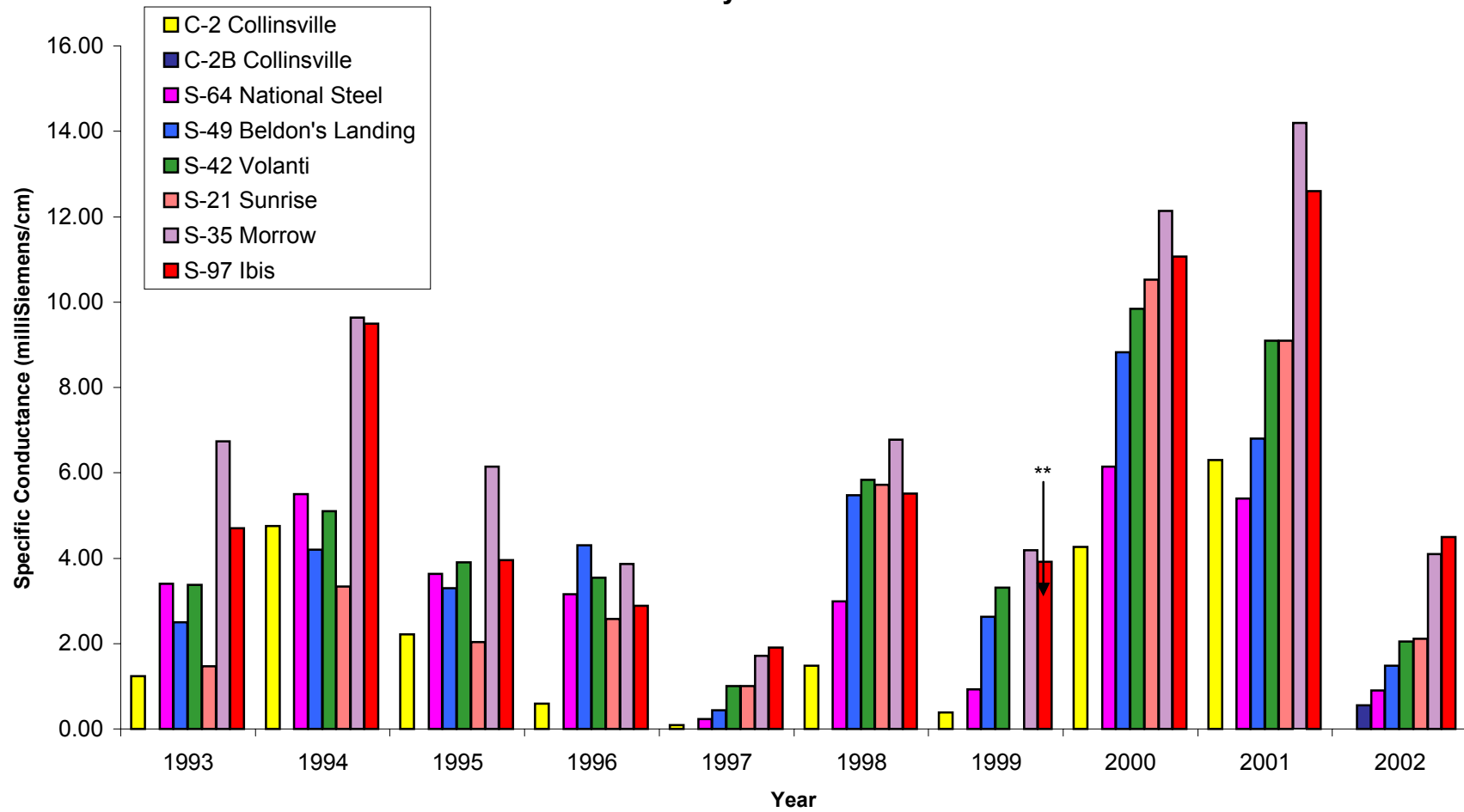


Figure 5

